

Global Change Master Directory  
Discover Earth science data and services

# NASA's Global Change Master Directory (GCMD): New Interfaces

**Presented by Scott Ritz (WYLE Information Systems)**  
**August 14, 2012**

- **New Interfaces: KMS, MWS, and NextGen**
- **Demo**
- **Usage Metrics**
- **Feedback**

# Keyword Management Service (KMS)

- RESTful web service that provides dynamic access to all GCMD keyword sets in:
  - Simple Knowledge Organization System (SKOS)
  - Resource Description Framework (RDF)
  - Web Ontology Language (OWL)
  - Comma-Separated Values (CSV)
- REST paths:
  - Concept Resource
  - Concepts - Root
  - Concepts - By Pattern
  - Concepts - By Concept Scheme + Pattern
  - Concepts Operations Resource

# Keyword Management Service (KMS)

```
-<rdf:RDF>
  <gcmd:termsOfUse>See http://gcmd.nasa.gov/r/1/TermsOfUse</gcmd:termsOfUse>
  <gcmd:keywordVersion>Jun122012</gcmd:keywordVersion>
- <skos:Concept rdf:about="02598fdd-7ff8-4d38-a2ac-f29d71523f18" xml:base="http://gcmdservices.gsfc.nasa.gov/kms/concept/">
  <skos:inScheme rdf:resource="http://gcmdservices.gsfc.nasa.gov/kms/concepts/concept_scheme/providers"/>
  <skos:prefLabel xml:lang="en">DOC/NOAA/NESDIS/NCDC</skos:prefLabel>
- <skos:altLabel xml:lang="en">
  National Climatic Data Center, NESDIS, NOAA, U.S. Department of Commerce
  </skos:altLabel>
- <skos:definition xml:lang="en">
  NCDC Home Page - "http://www.ncdc.noaa.gov/" NCDC is the world's largest active archive of weather data. NCDC produces numerous climate
  publications and responds to data requests from all over the world. NCDC operates the World Data Center for Meteorology which is collocated at NCDC
  in Asheville, North Carolina, and the World Data Center for Paleoclimatology which is located in Boulder, Colorado. NCDC supports a three tier national
  climate services support program - the partners include: NCDC, Regional Climate Centers, and State Climatologists. The National Virtual Data System
  (NVDS) uses the NOAA Server metadata search engine to find and access NOAA data from all NOAA Data Centers. Contact: National Climatic Data
  Center Federal Building 151 Patton Avenue Asheville NC 28801-5001 Phone: 828-271-4800 FAX: 828-271-4876 E-mail: ncdc.info@noaa.gov
  [Extracted from the NCDC Home Page]
  </skos:definition>
  <skos:broader rdf:resource="c9003d36-020d-4e86-995a-498945576c23"/>
  </skos:Concept>
</rdf:RDF>
```

# Metadata Web Service (MWS)

- Provides dynamic access to all GCMD metadata record types using RESTful web service structures.
- Retrieve a list of:
  - ALL metadata documents, filtering by a query expression (e.g., by instrument).
  - A specific metadata document, using its unique identifier.
  - Unique identifiers of metadata documents, filtering by a query expression.
  - Keywords for a specific metadata field.

# Metadata Web Service (MWS)

```
-<PROJECTSUPP xsi:schemaLocation="http://gcmd.gsfc.nasa.gov/Aboutus/xml/project/ http://gcmd.gsfc.nasa.gov/Aboutus/xml/project
/projectsupp_v9.8.3.xsd">
  <PEntry_ID uuid="5f139d40-4050-4a8e-bd2b-fcae1cfe3d01">ESIP</PEntry_ID>
  <Project_Long>Earth Science Information Partners Program</Project_Long>
  -<Project_Text>
    The NASA Earth Science Information Partners (ESIP) program is a prototype implementation of the National Research Council recommendation that, in the
    new Earth Science Information System (ESIS), "the responsibility for product generation and publication and for user services should be transferred to a
    federation of partners selected through a competitive process open to all." NASA established this site to further the objectives of the Earth Science
    Information System. We intend to employ communication and collaboration technologies to: a) Facilitate collaboration among ESIPs by fostering
    communication among the ESIPs and between ESIP teams, NASA as well as investigators involved in related work within and outside NASA, and b)
    Promote federation interaction with organizations developing interoperability specifications, such as the Open GIS Consortium, and W3C; with digital library
    technology R&D efforts, such as the NSF/ARPA/NASA joint initiative, standards bodies such as FGDC, etc. In addition, we will support the federation
    governance structure as it evolves. For more information, see: "http://www.esipfed.org/"
  </Project_Text>
  -<IDN_Node uuid="9ae20472-ba4c-4b01-8d97-857b73fa3c95">
    <Short_Name>USA/NASA</Short_Name>
    </IDN_Node>
    <Revision_Date>2008-06-09</Revision_Date>
  </PROJECTSUPP>
```

# Accessing KMS and MWS

- Keyword Management Service (KMS)

- Service:

- <http://gcmdservices.gsfc.nasa.gov/kms/capabilities?format=html>

- Documentation:

- <http://gcmd.gsfc.nasa.gov/Connect/docs/kms/KeywordManagementServiceAPI.pdf>

- Metadata Web Service (MWS)

- Service:

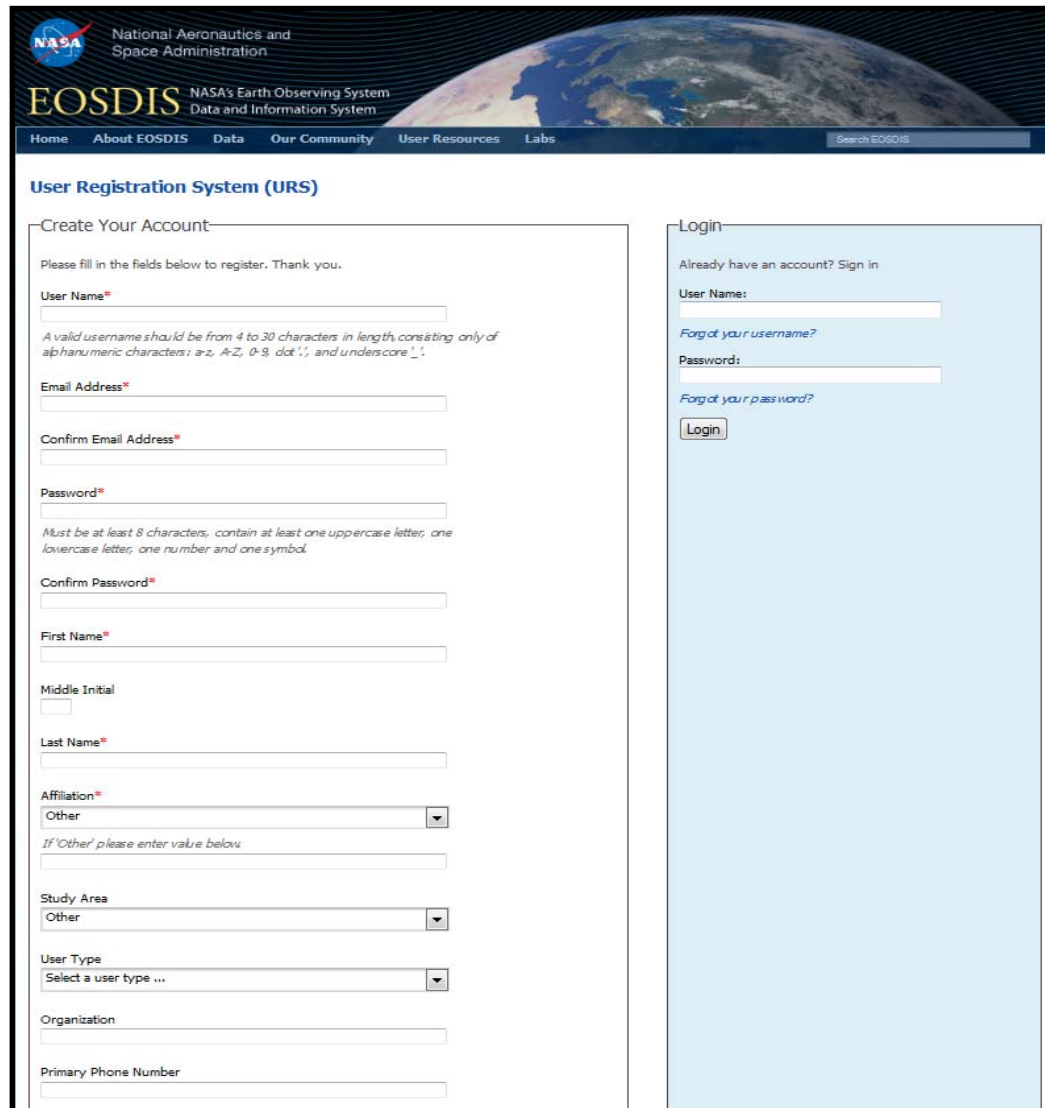
- <http://gcmdservices.gsfc.nasa.gov/mws/capabilities?format=html>

- Documentation:

- <http://gcmd.gsfc.nasa.gov/Connect/docs/mws/MetadataWebServiceAPI.pdf>

# Accessing KMS and MWS

Authentication using the EOSDIS User Registration System (URS):  
<https://urs.eosdis.nasa.gov/>



The screenshot displays the EOSDIS User Registration System (URS) interface. The header features the NASA logo and the text "National Aeronautics and Space Administration" and "EOSDIS NASA's Earth Observing System Data and Information System". A navigation bar includes links for Home, About EOSDIS, Data, Our Community, User Resources, and Labs, along with a search bar labeled "Search EOSDIS".

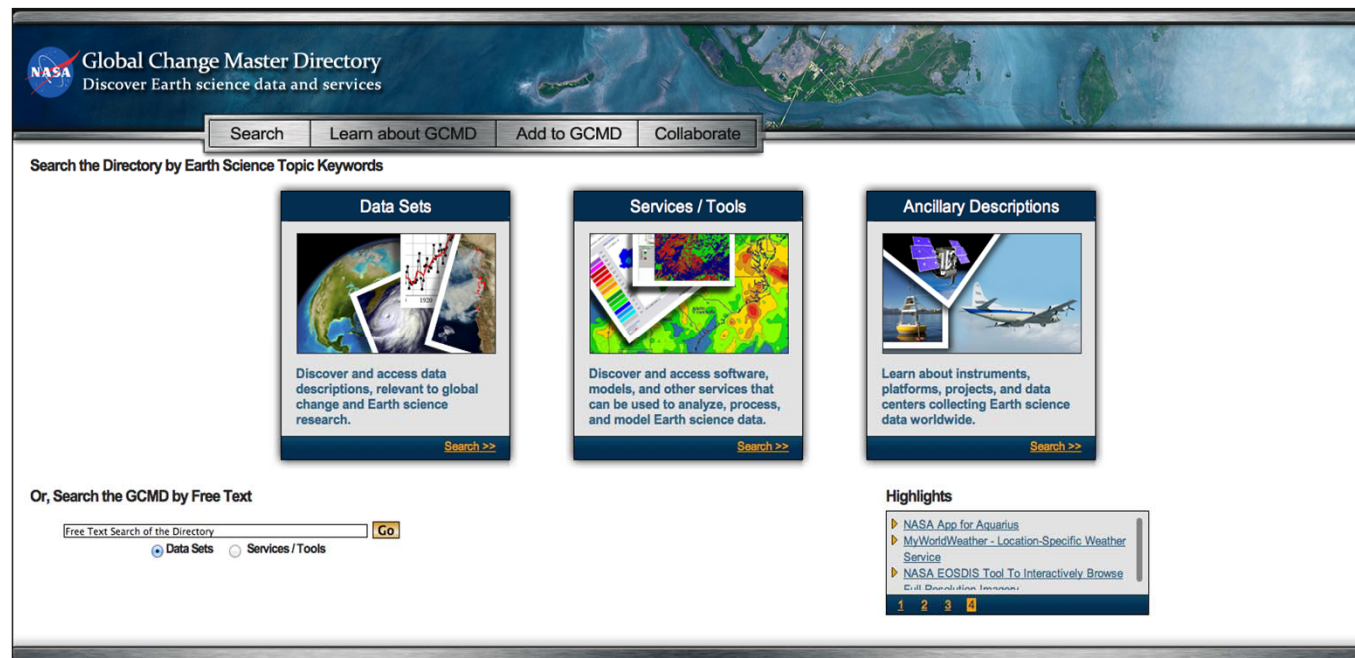
The main content area is titled "User Registration System (URS)" and is divided into two sections:

- Create Your Account:** This section prompts users to fill in the following fields:
  - User Name\***: A text input field with a note: "A valid username should be from 4 to 30 characters in length, consisting only of alphanumeric characters: a-z, A-Z, 0-9, dot '.', and underscore '\_'."
  - Email Address\***: A text input field.
  - Confirm Email Address\***: A text input field.
  - Password\***: A text input field with a note: "Must be at least 8 characters, contain at least one uppercase letter, one lowercase letter, one number and one symbol."
  - Confirm Password\***: A text input field.
  - First Name\***: A text input field.
  - Middle Initial**: A text input field.
  - Last Name\***: A text input field.
  - Affiliation\***: A dropdown menu with "Other" selected, followed by a note: "If 'Other' please enter value below" and a text input field.
  - Study Area**: A dropdown menu with "Other" selected.
  - User Type**: A dropdown menu with "Select a user type ..." selected.
  - Organization**: A text input field.
  - Primary Phone Number**: A text input field.
- Login:** This section prompts users to sign in:
  - User Name:** A text input field with a link "Forgot your username?".
  - Password:** A text input field with a link "Forgot your password?".
  - Login**: A button.



# NextGen Website

- New design and structure
- Improved access to data, services, and ancillary descriptions
- Advanced “tree” keyword search refinement
- Integration with MWS/KMS web services and docBUILDER
- Interface: <http://gcmd.nasa.gov/nextgen/>



# NextGen Website: Demo

 **Global Change Master Directory**  
Discover Earth science data and services

[Search](#) [Learn about GCMD](#) [Add to GCMD](#) [Collaborate](#)

Search the Directory by Earth Science Topic Keywords

### Data Sets



Discover and access data descriptions, relevant to global change and Earth science research.

[Search >>](#)

### Services / Tools



Discover and access software, models, and other services that can be used to analyze, process, and model Earth science data.

[Search >>](#)

### Ancillary Descriptions



Learn about instruments, platforms, projects, and data centers collecting Earth science data worldwide.

[Search >>](#)

Or, Search the GCMD by Free Text

[Go](#)

☒ Data Sets ☐ Services / Tools

### Highlights

- ▶ [NASA App for Aquarius](#)
- ▶ [MyWorldWeather - Location-Specific Weather Service](#)
- ▶ [NASA EOSDIS Tool To Interactively Browse Civil Population Images](#)

[1](#) [2](#) [3](#) [4](#)

# NextGen Website: Demo

The screenshot displays the Global Change Master Directory (GCMD) website. At the top, a banner features the NASA logo and the text "Global Change Master Directory Discover Earth science data and services". Below the banner is a navigation bar with buttons for "Home", "Search", "Learn about GCMD", "Add to GCMD", and "Collaborate". The main content area is divided into three tabs: "Data Sets", "Services / Tools", and "Ancillary Descriptions". The "Data Sets" tab is active, showing a search results page for the query "ICESHEETS FIRN ANTARCTICA". The page indicates "Results: 30 records found" and "Showing 1 - 30 of 30". On the left, a "Refine" sidebar allows filtering by keywords, with a tree view showing categories like "Science Keywords" (Atmosphere, Biosphere, Cryosphere, Frozen Ground, Glaciers/Ice Sheets, Sea Ice, Snow/Ice, Land Surface, Oceans, Paleoclimate, Spectral/Engineering, Terrestrial Hydrosphere), "Platforms", "Instruments", "Data Centers", and "Locations" (Continents, Antarctica). The main results area lists 10 records, each with a title, a link to the full record, and a brief description. The records cover topics such as nitrogen and oxygen gas isotopes, spatial variability in firn properties, cryosphere characteristics, methane isotopes, atmospheric chemistry, hydroperoxides, snow surface conditions, radiometry data, radar sounding, and surface snow density measurements.

GCMD Banner Image

Global Change Master Directory  
Discover Earth science data and services

Home Search Learn about GCMD Add to GCMD Collaborate

Data Sets Services / Tools Ancillary Descriptions

ICESHEETS FIRN ANTARCTICA

Refine by Keywords

Filter: Filter Reset

Science Keywords

- ATMOSPHERE (6)
- BIOSPHERE (1)
- CRYOSPHERE (30)
  - FROZEN GROUND (1)
  - GLACIERS/ICE SHEETS (30)
    - ABLATION ZONES/ACCUMULATION ZONES (4)
    - ☒ FIRN (30)
    - GLACIER ELEVATION/ICE SHEET ELEVATION
    - GLACIER FACIES (1)
    - GLACIER MASS BALANCE/ICE SHEET MASS B.
    - GLACIER MOTION/ICE SHEET MOTION (3)
    - GLACIER THICKNESS/ICE SHEET THICKNESS
    - GLACIER TOPOGRAPHY/ICE SHEET TOPOGR
    - GLACIERS (6)
    - ☒ ICE SHEETS (30)
    - ICEBERGS (3)
- SEA ICE (5)
- SNOW/ICE (28)
- LAND SURFACE (2)
- OCEANS (5)
- PALEOCLIMATE (10)
- SPECTRAL/ENGINEERING (2)
- TERRESTRIAL HYDROSPHERE (10)

Platforms

Instruments

Data Centers

Locations

- CONTINENT (30)
  - ☒ ANTARCTICA (30)

by Freetext

by Spatial Search

by Temporal Search


Results: 30 records found

Showing 1 - 30 of 30

- [1. Nitrogen and Oxygen Gas Isotopes in the Siple Dome and Byrd Ice Cores, Antarctica \[NSIDC-0407\]](#) PARENT DIF.  
This data set consists of Gas-isotopic data from the Siple Dome and and Greenland Ice Sheet Project 2 (GISP2) ice cores covering roughly the last 100,000 years (100 ka), consisting of d15N (15N/14N) ...
- [2. Spatial Variability in Firn Properties from Borehole Optical Stratigraphy at the Inland WAIS Core Site \[waddington\\_0538639\]](#)  
Award Abstract #0538639 Spatial Variability in Firn Properties from Borehole Optical Stratigraphy at the Inland WAIS Core Site This award supports a project to study the patterns of accumulation ...
- [3. NASA/SVS: A Tour of the Cryosphere 2009 \[SVS\\_CRYOSPHERE\\_VIS\]](#)  
The cryosphere consists of those parts of the Earth's surface where water is found in solid form, including areas of snow, sea ice, glaciers, permafrost, ice sheets, and icebergs. In these regions, ...
- [4. 2008 South Pole Firn Air Methane Isotopes \[sowers\\_0739491\]](#)  
This project will involve the measurement of methane and other trace gases in firn air collected at South Pole, Antarctica. The analyses will include: methane isotopes, light non-methane hydrocarbons ...
- [5. Atmospheric, Snow and Firn Chemistry Studies for Interpretation of WAIS-Divide Cores, Antarctica \[bales\\_0636929\]](#)  
This award supports a project to understand how recent changes in atmospheric chemistry, and historical changes as recorded in snow, firn and ice, have affected atmospheric photochemistry over Antarctica. ...
- [6. Atmospheric Mixing Ratios of Hydroperoxides above the West Antarctic Ice Sheet \[NSIDC-0394\]](#)  
This data set contains atmospheric mixing ratios of hydrogen peroxide and methylhydroperoxide at 21 sites on the West Antarctic Ice Sheet (WAIS) were obtained from 2000 to 2003 during the US International ...
- [7. Digital Pictures of snow surface taken from Microwave Radiometers during the JASE traverse 2007/2008 \[NIPR\\_JASE\\_7\]](#)  
Microwave radiometers were operated continuously. Digital camera was mounted on the microwave radiometers. Picture of snow surface condition was taken every 1 second entirely along the JASE traverse. ...
- [8. Microwave Radiometry data measured at frequencies and polarizations of 6 GHz \(V and H\), 18 GHz \(V\) and 36 GHz \(V and H\) during the JASE traverse 2007/2008 \[NIPR\\_JASE\\_6\]](#)  
Radio techniques were very important in the JASE traverse to detect subsurface conditions continuously. We used variety of radars and microwave radiometers to survey englacial and subglacial environment. ...
- [9. Radar sounding data of the ice sheet measure using Ground Penetrating Radar GSSI SIR-3000 with 270 MHz antenna, during the JASE traverse 2007/2008 \[NIPR\\_JASE\\_5\]](#)  
Radio techniques were very important in the JASE traverse to detect subsurface conditions continuously. We used variety of radars and microwave radiometers to survey englacial and subglacial environment. ...
- [10. Surface snow density measurements in the Antarctic Dome Fuji region during the summer of JASE traverse 2007/2008 \[NIPR\\_JASE\\_16\]](#)  
To better understand changes in snow density in summer and formation of snow stratification, we investigated temporal changes of surface snow density and its spatial distribution. Two types of snow-density ...



# NextGen Website: Demo


**Global Change Master Directory**  
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[Home](#) [Search](#) [Learn about GCMD](#) [Add to GCMD](#) [Collaborate](#)

[Data Sets](#) [Services / Tools](#) [Ancillary Descriptions](#)

### ICE SHEETS

**Refine**  
by Keywords  
by Freetext  
by Spatial Search  
  N:-43,S:-84,E:-4,W:-176



POWERED BY Google  
Imagery ©2012 NASA - Terms of Use  
☐ Enable map dragging

**Results: 331 records found**  
**Showing 1 - 50 of 331**

- 1. [IPY: Collaborative Proposal: Constraining the Mass-Balance Deficit of the Amundsen Coast's Glaciers \[das\\_0632031\]](#)**  
This award supports a project to gather data to better understand the mass balance of the West Antarctic Ice Sheet focusing on the Pine Island and Thwaites Glaciers along the Amundsen Sea coast. ...
- 2. [Amery Ice Shelf compiled and merged ice thickness datasets \[AIS\\_thickness\\_bottom\]](#)**  
Point datasets showing ice thickness over the Amery Ice Shelf and Lambert Glacier Basin were collected by Rachael Hurd under contract with the Glaciology program of the Australian Antarctic Division ...
- 3. [Cold Spice: Double Diffusion Generated by Vertical Ice Walls at Erebus Ice Tongue and Drygalski Ice Tongue, Antarctica \[K132\\_2010\\_2012\\_NZ\\_1\]](#)**  
"Ocean spice" refers to one of the great hidden mechanisms driving ocean mixing. Large regions of the oceans are layered in such a way that differences in molecular characteristics between heat and ...
- 4. [Collaborative Research in IPY: Abrupt Environmental Change in the Larsen Ice Shelf System, a Multidisciplinary Approach - Cryosphere and Oceans \[scambos\\_07329211\]](#)**  
This award supports the cryospheric and oceanographic components of an integrated multi-disciplinary program to address these rapid and fundamental changes now taking place in Antarctic Peninsula ...
- 5. [IPY: Collaborative Proposal: Constraining the Mass-Balance Deficit of the Amundsen Coast's Glaciers \[Gogineni\\_0631994\]](#)**  
This award supports a project to gather data to better understand the mass balance of the West Antarctic Ice Sheet, in the Pine Island and Thwaites region, through the combination of radar altimetry ...
- 6. [Atmospheric CO2 over the last 1000 years: A record from the WAIS Divide ice core \[brook\\_0739766\]](#)**  
These data are a decadal resolved record of atmospheric CO2 concentration for the last 1000 years, obtained from the West Antarctic Ice Sheet (WAIS) Divide shallow ice core.
- 7. [Land and sea ice structure west and south of Ross Island measured by ground penetrating radar, UAV, and helicopter EM bird \[K053\\_2009\\_2012\\_NZ\\_1\]](#)**  
This data set describes surface and volume properties of snow and ice to validate radar satellite measurements. Ground penetrating radar (GPR) at 500 and 1000GHz provides information on snow layers ...
- 8. [Meteorological data collected by two AWS \[org.polarresearch-771\]](#)**  
two automatic weather stations at 370 and 540 m a.s.l. along Etonbreen, W-slope of Austfonna, one recording all components of the energy balance (Tair, RH, Sin, Sout, Lin, Lout, Wdir, Wvel, snow and ...
- 9. [New Austfonna surface DEM from InSAR/ICESat \[org.polarresearch-750\]](#)**  
A new DEM of the Austfonna ice cap by combining SAR interferometry with ICESat laser altimetry
- 10. [Surface velocity, annual means at stakes and continuous records in a target area, Austfonna \[org.polarresearch-751\]](#)**  
Repeated DGPS measurements of (~20) mass balance stakes on the Austfonna ice cap and continuous GPS records on two fast flowing outlets (along the central flowlines of Basin-3 and Duvebreen; 5 units ...
- 11. [Microstructural Location and Composition of Impurities in Polar Ice Cores \[NSIDC-0436\]](#)**  
This data set contains measurements of impurities and ions in three polar ice cores: the Vostok 5G ice core and the Byrd ice core from Antarctica, and the ...

# NextGen Website: Demo

**Global Change Master Directory**  
Discover Earth science data and services

Home Search Learn about GCMD Add to GCMD Collaborate

Data Sets Services / Tools Ancillary Descriptions

**ICESHEETS**

Refine by Keywords

Filter: [ ] Filter Reset

**Science Keywords**

- AGRICULTURE (3)
- ATMOSPHERE (30)
- BIOLOGICAL CLASSIFICATION (7)
- BIOSPHERE (13)
- CLIMATE INDICATORS (3)
- CRYOSPHERE (331)
  - FROZEN GROUND (9)
    - GLACIERS/ICE SHEETS (331)
      - ABLATION ZONES/ACCUMULATION ZONES (3)
      - FIRN (32)
      - GLACIER ELEVATION/ICE SHEET ELEVATION
      - GLACIER FACIES (4)
      - GLACIER MASS BALANCE/ICE SHEET MASS B
      - GLACIER MOTION/ICE SHEET MOTION (44)
      - GLACIER THICKNESS/ICE SHEET THICKNESS
      - GLACIER TOPOGRAPHY/ICE SHEET TOPOGR
      - GLACIERS (92)
      - ☒ ICE SHEETS (331)
      - ICEBERGS (17)
    - SEA ICE (37)
    - SNOW/ICE (188)
  - HUMAN DIMENSIONS (16)
  - LAND SURFACE (35)
  - OCEANS (62)
  - PALEOCLIMATE (82)
  - SOLID EARTH (21)
  - SPECTRAL/ENGINEERING (32)
  - SUN-EARTH INTERACTIONS (1)
  - TERRESTRIAL HYDROSPHERE (135)

by Freetext +

by Spatial Search +

by Temporal Search +

Metadata

Open in new window Get permalink Print

**Amery Ice Shelf compiled and merged ice thickness datasets**

Entry ID: AIS\_thickness\_bottom

[ Get Data ] [ Update this Record ]

**1. IPY**  
This a  
Glacie

**Summary**  
**Abstract:** Point datasets showing ice thickness over the Amery Ice Shelf and Lambert Glacier Basin were collected by Rachael Hurd under contract with the Glaciology program of the Australian Antarctic Division in 2007. All available metadata for these datasets (how the data were originally collected, resolution, accuracy, etc) were also collected, and recorded in the one document. The surveys collated were:  
... [Click to view more](#)

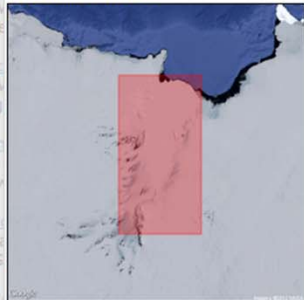
**2. Am**  
Point  
progr

**3. Col**  
"Ocea  
molec

**Related URL**  
Link: [GET DATA](#)  
**Description:** Amery Ice Shelf and Lambert Basin ice thickness datasets and priority order for merging - not publicly available  
[Click to view more](#)

**4. Col**  
[scam

**Geographic Coverage**



**5. IPY**  
This a  
throug

**6. Atr**  
These  
shallo

**7. Lar**  
This d  
1000C

**8. Mel**  
two at  
Sin, S

(Click for Interactive Map)

**Spatial coordinates**  
N: -68.45 S: -73.36 E: 74.25 W: 66.41

**9. New Austfonna surface DEM from InSAR/ICESat [org.polarresearch-750]**  
A new DEM of the Austfonna ice cap by combining SAR interferometry with ICESat laser altimetry

**10. Surface velocity, annual means at stakes and continuous records in a target area, Austfonna [org.polarresearch-751]**  
Repeated DGPS measurements of (~20) mass balance stakes on the Austfonna ice cap and continuous GPS records on two fast flowing outlets (along the central flowlines of Basin-3 and Duvegreen; 5 units ...

**11. Microstructural Location and Composition of Impurities in Polar Ice Cores [NSIDC-0436]**  
This data set contains measurements of impurities and ions in three polar ice cores: the Vostok 5G ice core and the Byrd ice core from Antarctica, and the

**as 06320311**  
c Ice Sheet focusing on the Pine Island and Thwaites

by Rachael Hurd under contract with the Glaciology

[tongue, Antarctica \[K132\\_2010\\_2012\\_NZ\\_11\]](#)  
oceans are layered in such a way that differences in

[disciplinary Approach - Cryosphere and Oceans](#)

program to address these rapid and fundamental

[Gogineni 06319941](#)  
c Ice Sheet, in the Pine Island and Thwaites region,

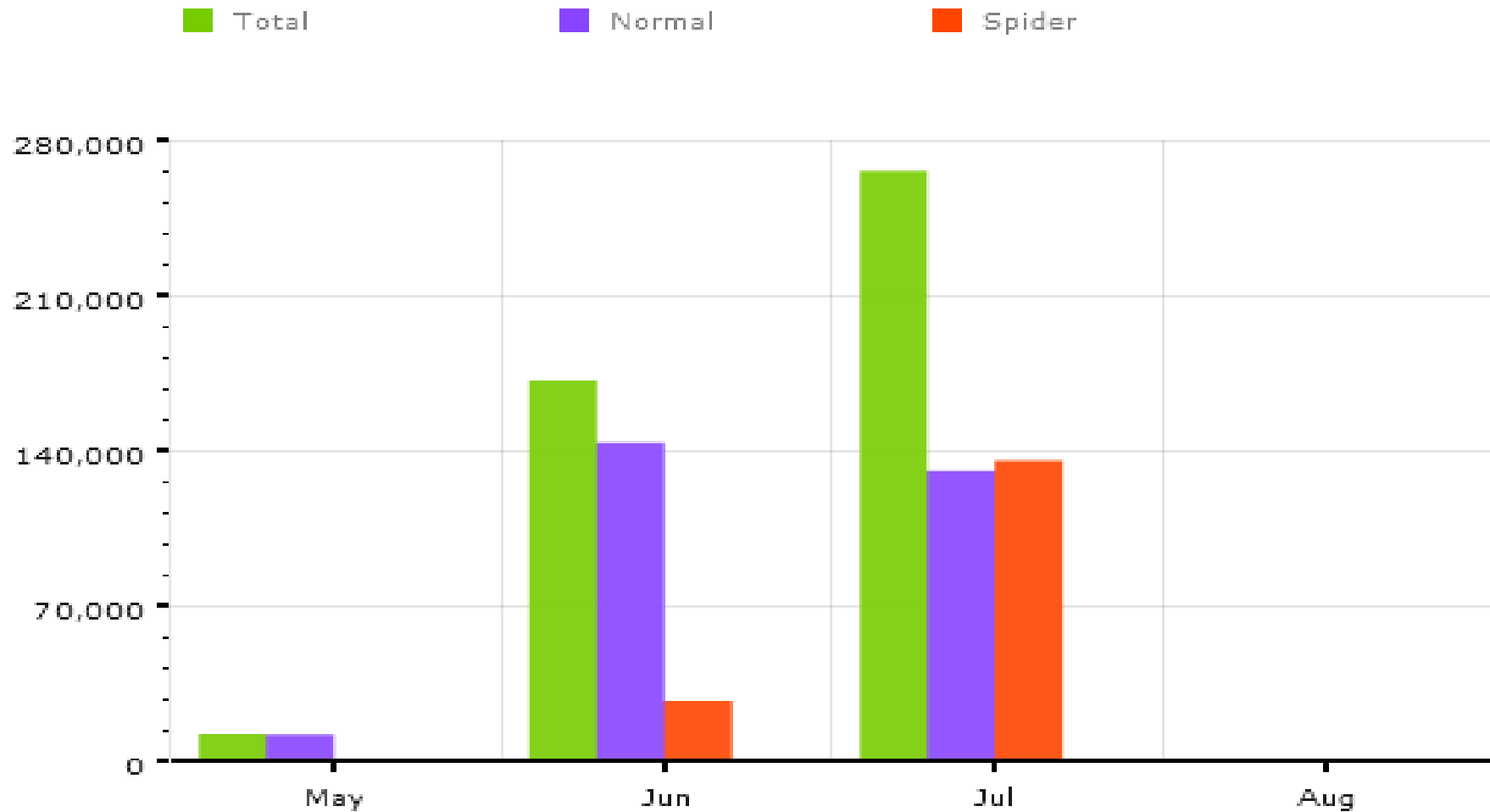
ained from the West Antarctic Ice Sheet (WAIS) Divide

[and helicopter EM bird \[K053\\_2009\\_2012\\_NZ\\_11\]](#)  
ments. Ground penetrating radar (GPR) at 500 and

ording all components of the energy balance (Tair, RH,

# Usage Metrics: NextGen

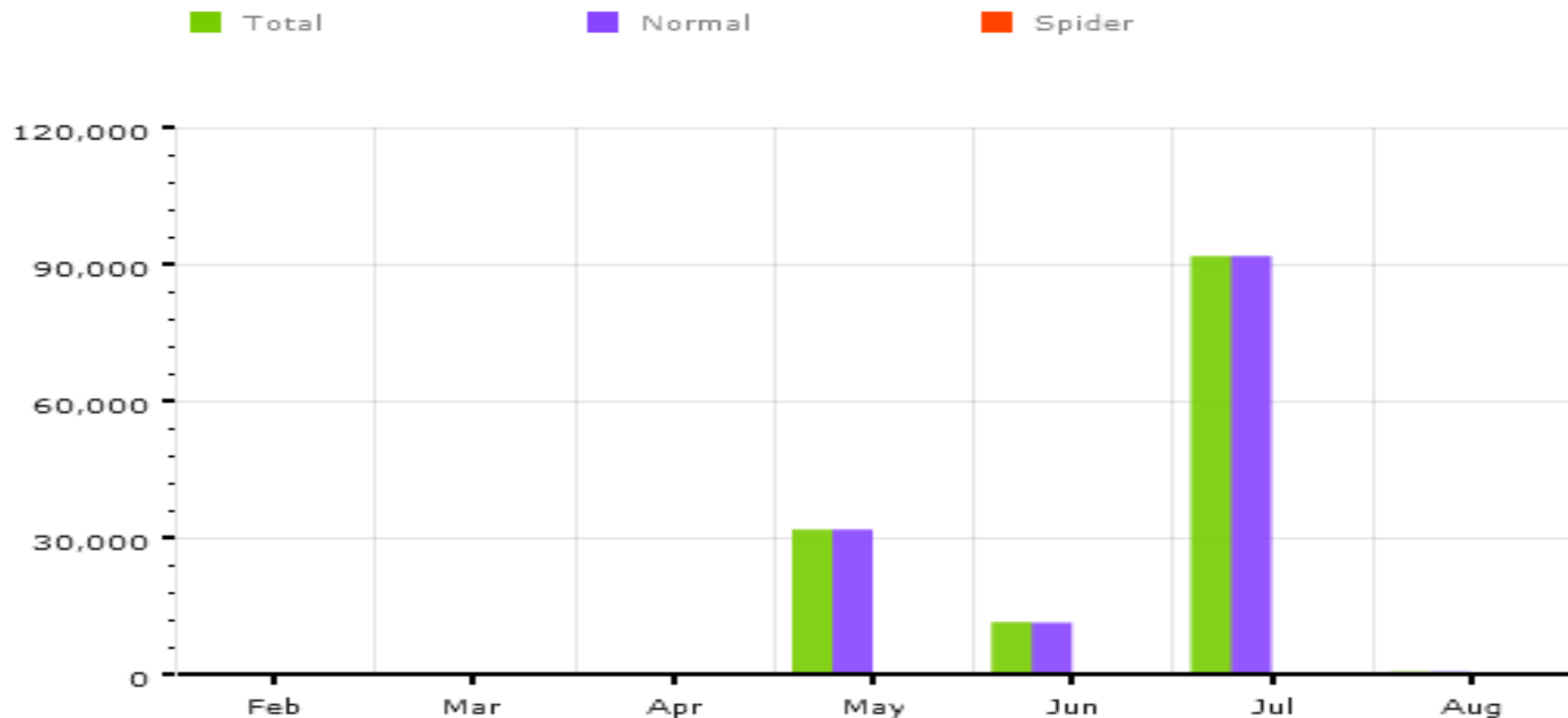
## Hits By Month



# Usage Metrics: Web Services

External usage of the GCMD web services (Keyword Management Service and Metadata Web Service) is increasing. There were 368 total visits in July 2012. Overall hits exceeded 91,000 in July. The “stay length” has increased significantly since June 2012 indicating that users are beginning to actively use the tools and not just browse.

## Hits By Month



# Feedback

- NextGen will be the primary site later this year.
- Enhancements will be continually made to KMS, MWS, and Nextgen.
- Help improve the user experience by submitting your feedback to: [gsfc-gcmduso@mail.nasa.gov](mailto:gsfc-gcmduso@mail.nasa.gov)



***Thank You***